

A magnetic bearing comprising axially spaced combinations of permanent magnets on a rotor and stator which are polarized to levitate the rotor and positioned with the rotor magnets offset axially outwardly of the stator magnets (or the rotor magnets offset axially inwardly of the stator magnets) to allow a force balance to be achievable to bear axial thrust. An electrically energizable coil modulates magnetic flux between the respective stator and rotor magnets for each combination. A first electrical circuit is provided to regulate electrical energy to the coils for maintaining a reference position of the rotor. A second electrical circuit responsive to feed-back of electrical energy to at least one of the coils is provided for comparing thereof with a reference electrical energy of about zero amps or volts and integrating the differences therebetween until the difference is about zero to provide a signal to modify the reference position, whereby to attain a zero force balance position wherein the current which must be supplied to the coils may be reduced to near zero.